



US00589922A

United States Patent [19][11] **Patent Number:** **5,899,922****Loos**[45] **Date of Patent:** **May 4, 1999****[54] MANIPULATION OF NERVOUS SYSTEMS
BY ELECTRIC FIELDS**

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FOREIGN PATENT DOCUMENTS**[76] Inventor:** **Hendricus G. Loos**, 3019 Cresta Way,
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[21] Appl. No.: **08/970,747***Primary Examiner*—William E. Kamm**[22] Filed:** **Nov. 14, 1997****[57] ABSTRACT****Related U.S. Application Data****[60]** Division of application No. 08/788,582, Jan. 24, 1997, Pat. No. 5,782,874, which is a continuation-in-part of application No. 08/447,394, May 23, 1995, abandoned, which is a continuation of application No. 08/068,748, May 28, 1993, abandoned.**[51] Int. Cl.⁶** **A61N 1/36****[52] U.S. Cl.** **607/2****[58] Field of Search** 607/2, 39, 45;
600/26

Apparatus and method for manipulating the nervous system of a subject through afferent nerves, modulated by an externally applied weak electric field. The field frequency is to be chosen such that the modulation causes excitation of a sensory resonance. The resonances found so far include one near ½ Hz which affects the autonomic nervous system, and a resonance near 2.4 Hz that causes slowing of certain cortical processes. Excitation of the ½ Hz autonomic resonance causes relaxation, sleepiness, ptosis of the eyelids, or sexual excitement, depending on the precise frequency used. The weak electric field for causing the excitation is applied to skin areas away from the head of the subject, such as to avoid substantial polarization current densities in the brain. Very weak fields suffice for bringing about the physiological effects mentioned. This makes it possible to excite sensory resonances with compact battery powered devices that have a very low current consumption. The method and apparatus can be used by the general public as an aid to relaxation, sleep, or sexual arousal, and clinically for the control and perhaps the treatment of tremors and seizures, and disorders of the autonomic nervous system, such as panic attacks.

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8 Claims, 4 Drawing Sheets